CLAIMS

Please amend the claims and add new claims as indicated below.

1. (Currently Amended) A reflectance sensor, comprising:

an optical unit, comprising:

a light source comprising a lamp; and

a fiber-optic system comprising fibers comprising an optical waveguide fiber and a reference waveguide fiber;

a sample analysis unit, comprising:

a measuring window; and

a removable sample analysis cell; and

a system control unit, comprising:

a detector for recording measured data; and

an evaluation device connected thereto;

wherein the optical unit is disposed on a first side of the measuring window and the sample analysis cell is disposed on a second side of the measuring window opposite the first side;

wherein the analysis cell is pressed against the measuring window to form a gap having a pressure drop between the measuring window and the analysis cell,

wherein the gap is traversed by a sample to be measured in the form of a liquid pigment preparation, the sample being sheared ~~considerably~~ by the pressure drop as it traverses the gap,

wherein the optical waveguide fiber extends from the light source to the measuring window, and from the measuring window to the detector, to generate a measured reflectance signal; and

further wherein the reference waveguide fiber extends directly from the light source to the detector or from the measuring window to the detector to produce a reference signal.

2. (Canceled)

3. (Previously Presented) The reflectance sensor of claim 1, wherein the lamp is selected from the group consisting of LEDs, gas discharge lamps and lamps with incandescent filaments.

4. (Previously Presented) The reflectance sensor of claim 1, wherein the lamp comprises an integrated shutter.

5. (Previously Presented) The reflectance sensor of claim 1, wherein the optical waveguide fiber has a diameter of 100 μm, 200 μm, 400 μm, 600 μm, or 800 μm.

6. (Previously Presented) The reflectance sensor of claim 1, wherein a diameter of the reference waveguide fiber is equal to or smaller than a diameter of the optical waveguide fiber.

7. (Currently Amended) The reflectance sensor of claim 1, further comprising:

a compensation filter downstream of the lamp, ~~,~~ that linearizes a spectrum from the lamp such that a difference between a highest and lowest intensity of the light beam is at most a factor 4;

an IR blocking filter, a condenser and a scattering disk downstream of the lamp;

a protective tube comprising the optical waveguide fiber and a supporting frame that supports the optical waveguide; or

a precise spacing element with an incorporated scattering disk comprising the reference waveguide fiber, and attenuated in a defined manner; or

~~or~~ a combination thereof.

8. (Previously Presented) The reflectance sensor of claim 1, wherein the measuring window is a 1 to 12 mm thick and 10 to 80 mm in diameter plane plate, the plane plate selected from the group consisting of glass, semi-precious stones and diamond.

9. (Previously Presented) The reflectance sensor of claim 1, wherein a length of the gap is 2 to 15 mm, a width of the gap is 2 to 40 mm, and a height of the gap is variably adjustable between 0.05 and 5 mm.

10. (Currently Amended) A reflectance sensor, comprising:

an optical unit, comprising:

a light source comprising a lamp; and

a fiber-optic system comprising fibers comprising an optical waveguide fiber and a reference waveguide fiber;

a sample analysis unit, comprising:

a measuring window; and

a removable sample analysis cell; and

a system control unit, comprising:

a detector for recording measured data; and

an evaluation device connected thereto;

wherein the optical unit is disposed on a first side of the measuring window and the sample analysis cell is disposed on a second side of the measuring window opposite the first side;

wherein the analysis cell is pressed against the measuring window to form a gap having a pressure drop between the measuring window and the analysis cell,

wherein the gap is traversed by a sample to be measured in the form of a liquid pigment preparation, the sample being sheared by the pressure drop as it traverses the gap,

wherein the optical waveguide fiber extends from the light source to the measuring window, and from the measuring window to the detector, to generate a measured reflectance signal;

wherein the reference waveguide fiber extends directly from the light source to the detector or from the measuring window to the detector to produce a reference signal; and

~~The reflectance sensor of claim 1,~~ wherein the sample is sheared by a pressure drop of 0.1 to 3 bar in the gap over a length of 1 to 15 mm from an entry point to an exit point of the sample.

11-12. (Canceled)

13. (Previously Presented) The reflectance sensor of claim 1, wherein the system control unit comprises detectors consisting of fiber-optic monolithic diode-line sensors that provide a resolution of at least 15 bits.

14. (Previously Presented) The reflectance sensor of claim 1, disposed in a common housing comprising a ventilation and a thermostat-controlled heat dissipation.

15. (Currently Amended) A method of measuring a reflectance of a liquid pigment preparation with a reflectance sensor, the reflectance sensor comprising:

an optical unit, comprising:

a light source comprising a lamp; and

a fiber-optic system comprising fibers comprising an optical waveguide fiber and a reference waveguide fiber;

a sample analysis unit, comprising:

a measuring window; and

a removable sample analysis cell; and

a system control unit, comprising:

a detector for recording measured data; and

an evaluation device connected thereto;

wherein the optical unit is disposed on a first side of the measuring window and the sample analysis cell is disposed on a second side of the measuring window opposite the first side;

wherein the analysis cell is pressed against the measuring window to form a gap between the measuring window and the analysis cell,

wherein the gap is traversed by a sample to be measured in the form of a liquid pigment preparation, the sample being sheared considerably as it traverses the gap,

wherein the optical waveguide fiber extends from the light source to the measuring window, and from the measuring window to the detector, to generate a measured reflectance signal; and

further wherein the reference waveguide fiber extends directly from the light source to the detector or from the measuring window to the detector to produce a reference signal;

the method comprising:

forming a sample stream with a defined thickness in the gap, the sample consisting of the liquid pigment preparation;

introducing a pressure drop into the gap;

shearing the sample stream in the gap with the pressure drop;

irradiating the sample stream with electromagnetic radiation emitted by the light source, the electromagnetic radiation interacting with the sample and some of the radiation being reflected diffusely following interaction with the sample;

receiving and measuring the diffusely reflected radiation as the measured reflectance signal;

receiving and measuring electromagnetic radiation emitted by the light source which does not interact with the sample as the reference signal; ,

the measured reflectance signal and the reference signal being measured simultaneously.

16. (Canceled)

17. (Previously Presented) The method of claim 15, wherein:

measuring the reflectance of the liquid pigment preparation is during a process stage in the production of the liquid pigment preparation, further processing of the liquid pigment preparation, or use of the liquid pigment preparation;

wherein the process stage comprises quality control during the dispersion of pigmented coatings and pigment pastes, quality assessment during coating production, controlling a metering system during formulation of coatings by mixing various liquids, automatically controlling color adjustment by means of tinting during coating production, matching a color of a coating in a coating system that comprises a metering system for

colored pastes, or monitoring subsequent color changes as a result of ageing or shear stressing.

18-19. (Canceled)

20. (New) A reflectance sensor for measuring a sample, comprising:

an optical unit having a light source and a fiber-optic system having an optical waveguide fiber and a reference waveguide fiber;

a sample analysis unit having a measuring window and a removable sample analysis cell; and

a system control unit having a detector for recording measured data, the optical waveguide fiber extending from the light source to the measuring window, and from the measuring window to the detector to generate a measured reflectance signal, the reference waveguide fiber extending from the light source to the detector or from the measuring window to the detector to produce a reference signal, the analysis cell located against the measuring window and forming a gap therebetween, that includes a pressure drop between the measuring window and the analysis cell, the gap adapted to be traversed by the sample in the form of a liquid pigment preparation, the sample being sheared by the pressure drop as it traverses the gap.

21. (New) A method of measuring a reflectance of a liquid pigment preparation with a reflectance sensor the method comprising:

forming a sample stream with a defined thickness in a gap between a measuring window and an analysis cell of the reflectance sensor, the sample comprising the liquid pigment preparation;

introducing a pressure drop into the gap;

shearing the sample stream in the gap with the pressure drop;

irradiating the sample stream with electromagnetic radiation emitted by a light source, the electromagnetic radiation interacting with the sample and some of the radiation being reflected diffusely following interaction with the sample;

receiving and measuring the diffusely reflected radiation as a measured reflectance signal;

receiving and measuring electromagnetic radiation emitted by the light source which does not interact with the sample as a reference signal; and

simultaneously measuring the reflectance signal and the reference signal.